

ACCOUNTING PRACTICES OF CACAO FARMERS IN SOUTHERN BELIZE

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ABSTRACT

The Toledo district of southern Belize suffers from extremely high poverty rates and many living in this region do not make enough money in order to feed themselves and their families a healthy daily calorie intake. A strengthening cacao industry has lowered poverty rates in recent years, but this industry is facing problems of its own. Farmers have no method to keep track of costs and income making it difficult to budget their resources and run their farms efficiently and effectively. Also the industry is becoming stagnant because growers associations cannot attract new farmers because there is no financial information available to reassure new farmers that the risk of the initial investment will reap rewards in the future. By looking at the geography, culture, and economy of this region, I developed an Excel based accounting system for these farmers to use and a method to implement it into the cacao industry. The system will help farmers keep track of the spending and profits and also give the growers associations access to the financial information they have been needing. This will grow the cacao industry and therefore help alleviate poverty in Toledo.

INTRODUCTION

Problems

While the purpose of this research is to produce an accounting system for cacao farmers in the Toledo District of southern Belize, the goal is much more than the system itself. The Toledo district in southern Belize is the poorest in the country and a large percentage of the population live in poverty. The goal of creating an accounting system is to help farmers in the region improve the operations of their farms and make more money in order to help themselves and their families rise out of poverty. The growth of current farms will promote the growth of the economy as a whole in the region. When farms grow, it requires more workers to maintain and harvest the cacao which provides jobs to those who need them. This system will allow cacao growers associations to promote the cacao industry. When farmers share the information they have learned about their own farms with the growers associations, it will strengthen their relationship and encourage others to enter the market because of the benefits they see from the industry. This is a major problem that the associations find themselves having now. Because farmers currently have no method to keep track of their costs or revenues, growers associations have no way of promoting the financial benefits of growing cacao. This lack of financial information makes it difficult for investors to know if the capital they need to invest to start a farm leads to adequate returns in the future, because neither the risks nor the rewards have been properly calculated. With investors not knowing the financial information necessary to make an informed decision on whether their investment will pay off in the future or not, only a few people to be willing to take the risk. This causes growth in the cacao industry to be slower than it could be if this information was readily available.

I personally learned of the difficulties both farmers and growers associations had with the financial information associated with cacao farms when I travelled to Belize with the Walker College of Business in an alternative Spring Break study abroad. The purpose of our trip was to help in the marketing and supply chain of one small farm in the town of San Pedro Columbia. The name of the farm was Agouti Cacao Farm, and was a part of Eladio's Chocolate Adventure, both of which are owned and operated by Eladio Pop and his son Feliciano. Eladio is the patriarch of his family and is the one who is in charge of his farm's operations. Feliciano is in charge of Eladio's Chocolate Adventure which gives tours of the farm, sells authentic Mayan chocolate and crafts, and takes customers to swim and tube on the local river, the Colombia Branch which runs into Belize's Rio Grande. Feliciano is also the member of the family who is in charge of the business side of his father's farm. Feliciano makes most of the marketing and financial decisions that are critical to the profitability of the farm. As our group met Feliciano and made suggestions for new lines of chocolate and better ways to promote the business, I, being an accounting major, wanted to know what his budget limitations were. When I inquired about the annual or monthly costs of running the farm, Feliciano did not know any information about his costs nor did he know the average amount the farm made in selling their cacao in each harvest. The only information that Feliciano had about the financial performance of the farm was the receipts that were kept from selling the cacao beans to cooperative groups. I did not understand how a business could function without knowing its own financial information or make decisions without knowledge of how these actions would affect the financial position of the farm. The problem became even more apparent in a discussion with a representative from the Toledo Cacao Growers Association (TCGA), Estevan Assi. Assi described the TCGA's desire to promote the cacao industry in

the region and encourage farmers to invest in cacao, but mentioned the problems of ensuring those investors that their investments would yield appropriate returns because of their lack of financial information on the performance of these farms. The startup costs, regular expenses, and operating revenue of these farms were unknown to the TCGA, and they had no way of finding this information. These are the problems that got me interested in searching for solutions.

Purpose

The purpose in this research is to develop an accounting system for small cacao farmers living in the Toledo district in order for them to properly manage their budgets. It will also help cacao growers associations in the region to promote the growth of cacao by giving them the information necessary to inform investors interested in starting cacao farms about the costs and eventual rewards from producing cacao. It will also help these organizations to better understand farmer needs and either supply those needs or provide support where necessary.

This accounting system will be an excel spreadsheet that can be used to enter transactions, such as selling cacao beans, buying seeds, or paying laborers. Once these transactions are entered, the spreadsheet will automatically show how these numbers affect the farmer's expenses, revenue, inventory, and cash balance. The spreadsheet will also be equipped with Critical Success Factors (CSFs) to let farmers know of certain areas which need improvement or attention, such as warnings appearing when there is a cash balance lower than \$100. These warnings and notices will allow farmers to make changes necessary to better manage their money and make better purchasing decisions. The system needs to be

easy to use, and simple to follow, considering that many of these farmers have limited education and virtually no accounting knowledge.

The farmers will also need to be taught how to use the system once it is delivered to them. This can best be done by taking advantage of the current cacao farmer associations in the Toledo district of Belize to help farmers learn to manage their budgets and teach them to how to enter data and know what the different numbers and spreadsheets are telling them about their current and future business operations. This will need to be explained to the growers associations as well, along with how to teach it to the farmers. A group of students going to Belize would be the best way to do this. The Walker College of Business currently has trips every year to this same area in Belize and is committed to helping the farmers in the region.

This accounting system will help farmers in the area understand their budgets and provide the necessary information needed in order to promote the production of cacao by growers associations in the region. Developing an accounting system solves all the basic problems of the farmers and growers associations, but goes above these and helps solve economic problems in the region and country. The financial information this system will provide will help grow the cacao industry in the region. A strong cacao industry in the Toledo district would help grow the economy in the region and bring many out of poverty. With Toledo being the poorest region in Belize, a strong improvement in their economy can improve Belize's economy as a whole.

Method

Before describing the system, there is some important background information to go over to gain a better understanding of the problems and how the solution effectively solves

these problems. First, I will describe the geography, culture, and economics of the region and how they play an important role in the cacao growing and supply chain process. Within this section I will also discuss the major problems of the region; the poverty of the Toledo district and the problem of financial literacy in Belize. While presenting these problems I will also present how a strong cacao industry and this accounting system are adequate solutions. Next, a review of the cacao growing process and supply chain will show the farmers' lifestyle and how cacao is taken from their hands to international markets through the help of cooperative groups. The two main cooperative groups (the Toledo Cacao Growers Association and Maya Mountain) are explored in order to show the strong relationships these organizations have with farmers in the region. After all the background information has been addressed, the accounting system will be described in full and implementation of the system will also be discussed.

GEOGRAPHY, CULTURE, AND ECONOMICS

Geography

Belize is located in Central America at 17°15' north of the equator and 88°45' west of the Prime Meridian on the Yucatan Peninsula, as seen in Figure #1 (CIA, 80). It shares a border with Mexico to the north and Guatemala to the west and south and its east coast is on the Caribbean Sea. The country is around 8,860 square miles which makes slightly smaller than Massachusetts (CIA, 80). Belize is mainly made up of rainforests, which covers approximately 50% of the country (CIA, 80). The southern region of the country is dominated by the relatively low Maya Mountains.

Figure #1



(Belize [Map], 1)

The climate of Belize is subtropical and the country experiences a clear wet season, from June to November, and dry season, from February to May. Annual rainfall varies through the country. In the north, annual rainfall averages around 50 inches while the southern part of the country receives around 175 inches. The average temperature is around 74°F in December to 84°F in July. Hurricanes can also strongly affect Belize between the months of July and November. In 2000, hurricanes damaged much of the country's infrastructure and displaced thousands of Belizeans (Alford, 1). In 2008, the flooding caused by hurricanes greatly damaged the nation's agricultural production and led to a downturn to the nation's economy (along with the global financial crisis).

Figure #2



(Belize: Political Map, 1)

Politically, Belize is broken up into six different districts; Corozal, Orange Walk, Belize, Cayo, Stann Creek, and Toledo, seen in Figure #2. The capital of Belize is Belmopan which is located in the center of the country in the Cayo district. The Belize district is the home of the nation's former capital, Belize City. Belize City is the site of the nation's only international airport and the nation's primary shipping port. The region this research is focused upon is the Toledo district. Toledo is the southernmost district in Belize and Punta Gorda is its capital. Punta Gorda is situated on the coast and is 165 miles away from Belize City. This secluded location from the main international ports becomes an important challenge in the supply chain for small cacao farmers in Toledo who need to get their product

to international buyers. Within the Toledo district are many small towns and villages, many of which are traditionally Mayan. Toledo boasts the highest concentration of Mayan villages in the country (Jones, 778). The reason Toledo is the focus is because this is the region in which the cacao industry has the most prolific presence and can benefit the greatest economically by developing a stronger and established cacao industry (which will be discussed in the “Poverty” portion of this paper).

Mayan Culture

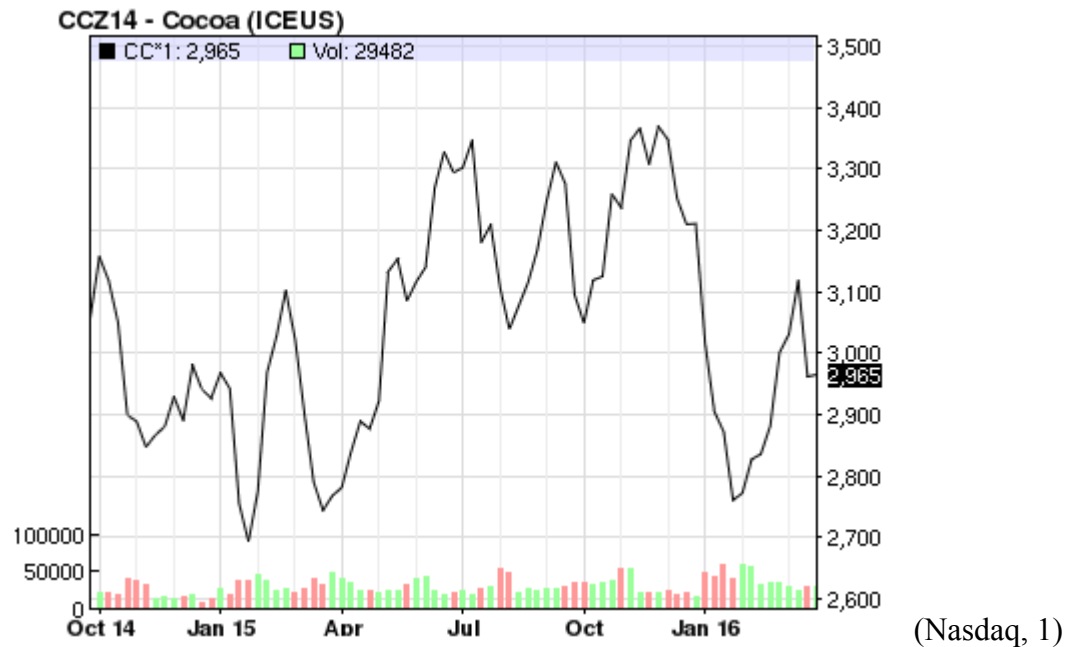
Most of the population of the Toledo district is of Mayan decent. In Belize, 44% of the population is Mestizo, which means they are of both Mayan and European decent, and 11% is Mayan (Belize 2015, 1). Toledo is the home to many Mayan ruins including Lubaantun (meaning the place of the fallen stones), Nim Li Punit, Uxbenka, and many more small or local sites which can be visited from specific villages (Prager, 250). As you walk through the rain forests and cacao farms of Toledo, you often come across large stones that look out of place. The farmers will tell you that it is possible that they have come across Mayan ruins that had been conquered by the jungle hundreds of years ago. Because these finds are so commonplace and because of the deep respect the Mayan people have for their lost civilization, many just leave the sites as they have found them.

Most of the Mayan people in the Toledo district are either Mopan or Quiché. These different cultures reflect different groups of ancient Mayan people. Cacao production plays an important part in Mayan culture. The Mayan people have been growing cacao and making chocolate in that region for thousands of years. Mayans typically consumed chocolate in the form of a liquid which is described as the “food of the gods.” It was highly regarded and was mainly reserved for rulers, the elite, and warriors, while commoners enjoyed the drink only

on certain special occasions. Drawings of cacao pods can be seen on Mayan stone tablets and in Mayan artwork (Grivetti, 4). There are artifacts of elaborate vessels the Mayans used for chocolate drink. Chocolate was used in important ceremonies in Mayan society including weddings and even human sacrifice. Cacao is mentioned in the sacred text of Popol Vuh and was a key ingredient in creating humans in the Mayan creation narrative (Grivetti, 5). Cacao was also known for its medicinal purposes. Warriors were told to drink it for the energy it provided and enemies cherished and often attempted to steal chocolate from Mayan warriors.

The cacao is still greatly respected by the Mayan men and women who grow it every day. The farmers enjoy drinking the cacao drink at lunch because of the energy it provides to help them finish the day. It is also a popular drink for breakfast for the same reason. Farmers are also proud of the taste of the cacao bean and some farmers do not like the bitterness of the bean being over powered by sugar or another sweetener. They are proud of the organic way they have grown the beans and the ancient process they have used to harvest, ferment, dry, and roast them. The high quality of the organic beans these farmers produce are a result of the pride that they farmers take in their product and can be seen with the prices buyers are willing to pay for Belizean organic cacao. The Toledo Cacao Growers Association, which is discussed later in this paper, sells their cacao for between \$4,000 and \$4,500 per metric ton. When compared to the market price of cacao, which fluctuated between \$2,700 and \$3,400 per metric ton (as seen in Figure #3), these prices are much more favorable (Commodities, 1).

Figure #3



Many of the Mayan families grow cacao, but only on their own personal family farms and for their own personal consumption. The kinds of farms that are needed in order to improve the cacao industry are farms where the product is harvested and primarily used for sale and export to foreign buyers. Some Mayan people are afraid of the environmental impact of producing cacao on a large scale. The Mayan people not only prize their chocolate, but also everything that nature provides. Part of the Mayan culture is their deep respect for nature, possibly because of their deep respect for their past culture. The ancient and thriving Mayan culture, which consisted of over 19 million people, disappeared between the 8th and 9th century AD. Many of the highly populated cities, such as Lubaantun, became deserted almost overnight. Most researches and the Mayan of Belize attribute this mysterious fall of the ancient Mayan culture to an imbalance between the environment and the Mayan way of life. The ancient Mayans used slash and burn techniques to grow main sources of their food, typically beans and corn. According to an article in Smithsonian Magazine, researchers

believe that these slash and burn techniques caused mass deforestation. Because cleared land absorbs less solar radiation, less water is evaporated. With less evaporated water, there is less rain clouds which caused droughts (Stromberg, 1). These droughts caused crops to fail. Low crop yields in combination with large population density led many citizens to face starvation or leave these massive Mayan cities. The Maya believed their kings had favor with the gods if the gods blessed them with crops. But because food was scarce, people lost faith in their kings and war and rebellions erupted. This chain of events became a downward spiral that led to the fall of the civilization; and it all began with an imbalance among the people and their environment. This is one of the reasons organic cacao production is so highly prized in Belize. All the growers associations push for farmers to get an organic certification to ensure the sustainable growth and harvest of their cacao beans. This devotion to organic cacao farms pays off in the increased price the farmers receive for their beans. Plus the growth of cacao in itself is good for the environment; the environmental benefits of the cacao tree will be discussed in “Cacao: the growing process and supply chain” portion of this paper.

Poverty in Toledo

Poverty has been defined in many different ways by different organizations throughout time, some of these definitions are: ‘The condition of being without adequate food, money, etc.’ – The Collins English Dictionary ‘(Having) an income which, even if adequate for survival, falls radically behind that of the community as a whole’ – J.K. Galbraith, 1962 ‘(The) inability to attain a minimum standard of living’ – World Bank, 1990 (Poverty, 43). When talking about poverty, I will be speaking in terms of two different types of poverty. Both types are measured by the ability to afford enough food in order to live a healthy lifestyle. This is the cost to feed an adult (age 19-29) male 2,400 calories per day

(Poverty, 44). Percentages of this number are used to calculate the healthy minimum calorie intake for different ages and for both genders. Those who are classified as “indigent” cannot meet this basic need, much less the non-food expenditures. Non-food expenditures relate to basic survival needs such as access to water and minimal amounts of health care, education, and transportation. Those who can meet the food requirements, but not the other non-food expenditure needs are considered “poor but not indigent” (Poverty, 54). According to a poverty assessment of Belize done in 2010, just under one third of households (31%) and 41% of the total population were considered to be impoverished. Just over 10% of households and 16% of the total population were classified as indigent (Poverty, 56) (Poverty, 59). While these numbers seem high, the Toledo district has much higher rates. The household poverty rate of Toledo is the highest in the country at 46.4%; 37.5% of the population of Toledo is characterized as indigent. The percentage of indigent households is by far the highest in Belize with Stann Creek following at 11.9% (Poverty, 56) (Poverty, 59).

The total population numbers are staggering as well. These numbers relate to individuals who are in poverty, as opposed to households (Household poverty rates are presented in the above paragraph). In Toledo, 60.4% of the total population is under the poverty line. Almost half (49.7%) are indigent (Poverty, 56) (Poverty, 59). The Mayan ethnicity, which is the most prominent in Toledo, show high poverty rates as well. Over half (51%) are indigent and 68% of the Mayan population are impoverished (Poverty, 71).

Between 2002 and 2009, overall household poverty in Belize increased 27%, from 31% to 41.3%, partially due to the global financial crisis in 2008 and massive flooding caused by hurricanes (Poverty, 56). Every district had increased poverty rates except for one, the Toledo district. The Toledo district actually decreased in overall poverty during this

period, the household poverty percentage decreased from 67.3% in 2002 to the 46.4% of 2009. The total population percentage of poverty, in Toledo, dropped from 79% to 60.4% (Poverty, 56) (Poverty, 59). The Mayan people's poverty rate also decreased. In 2002, 77% of the Mayan population lived in poverty, by 2009 this percentage dropped to 68% (Poverty, 71). There were a few explanations given as to why the financial crisis did not affect the Toledo district as it had the other districts, the main one being the isolation of the region to the rest of the country. This does not, however, explain the decrease in poverty. The decreased poverty levels in Toledo are attributed to the increased cacao production in this region (Poverty, 137). Because cacao is an expanding industry in Southern Belize, it will help grow the economy of the region and continue to bring the people of Toledo, especially of Mayan ethnicity, out of poverty.

Financial Literacy in Belize

While a growing cacao sector will continue to decrease poverty in the Toledo district, there is another way in which the people of Belize hope to improve their financial situation. This is to improve financial literacy within the country. Since 2008, PricewaterhouseCoopers (PwC), Peace Work, the Ministry of Education, and Belize Bank Limited have worked together to solve economic and social challenges by incorporating financial literacy and entrepreneurship into the public school system (Belize Bank, 1). Peace Work is a nonprofit organization that engages communities, academic institutions, and corporations in innovative solutions to agriculture, business, education, engineering, health, public service, and technology problems. This organization is involved in 17 different countries and over 70 academic institutions. It has invested over \$23.7 million in order to reach approximately one million children worldwide (Peace Work, 1). PwC is the world's second largest professional

services network and is classified as one of the Big Four accounting firms. Their “Project Belize” is an effort to promote financial literacy in schools in order to help Belizeans out of poverty. PwC chose Belize for their efforts because of the financial difficulty Belizeans are facing. They cite that of Belize’s 300,000 population 50% are younger than 20 years old and that enrollment in secondary education, middle and high school, is only 60%, primarily because of financial barriers. The cost to attend a secondary school is \$500 for tuition plus the costs of uniforms and books which average to be another \$500 (Earn, 1). In 2010, the median monthly income for agriculturalists was only \$400 (Poverty, 78). Another problem that members of PwC found of concern is that only 35% of 5,000 teachers have been formally trained, because only a primary school education is required for teachers (Earn, 1). Since “Project Belize” began, PwC has delivered their financial literacy curriculum to 6,412 students with the help of 1,609 skilled and well-educated PwC interns, partners, and staff and have influenced 435 teachers to incorporate financial literacy into their regular curriculum (Earn, 1). Because financial literacy is the foundation of economic growth and development, these organizations believe that through financial literacy Belize’s economy can be vastly improved. Therefore, combining financial literacy with the growing cacao industry can provide a strong relief to poverty in the Toledo district.

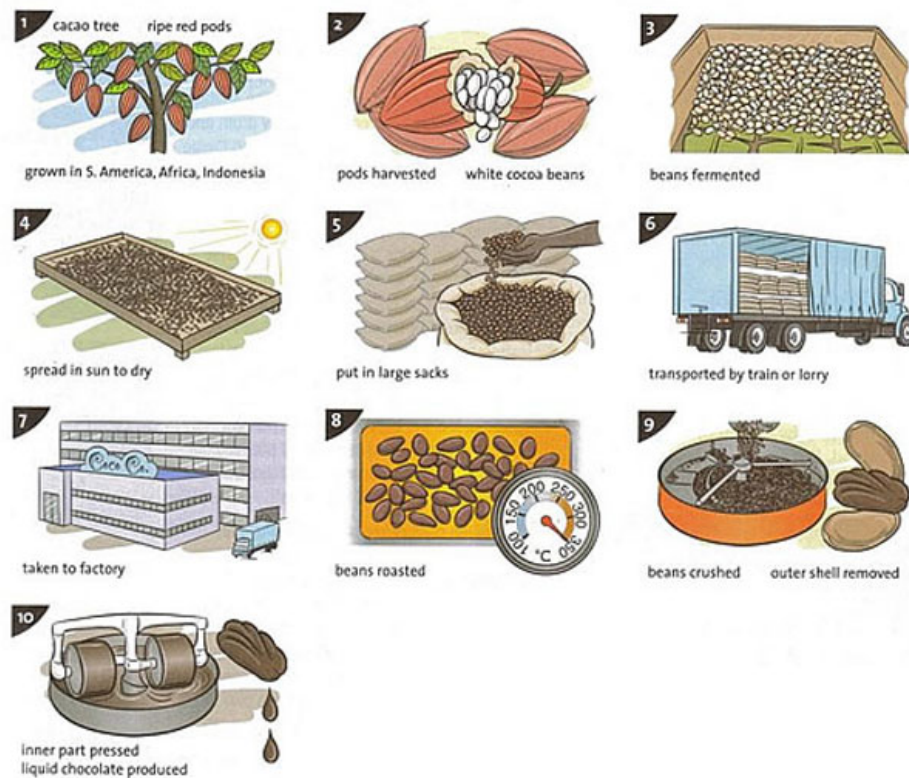
CACAO: THE GROWING PROCESS AND SUPPLY CHAIN

Around 4.5 million farmers and their families produce cacao to support themselves (World, 2). Nearly all of these farmers are local, family operated, small-scale producers, this is the nature of the cacao industry. There is nothing like the massive “agribusinesses” that grow other crops on a mass scale. The average cacao farm worldwide is only 6-10 acres and

operated by an average of 8 family members, while in Belize the average farm is only about 2 acres (World, 6) (Estevan Assi Interview).

Cacao grows from the *Theobroma cacao* tree, an evergreen tree found in over 50 tropical countries. The name of the tree comes from the Greek roots of the name given to chocolate by the Mayans: “food of the gods” (Young, 12). The trees can grow up to 30 feet tall, but are often pruned in order to make harvesting more manageable. Cacao trees need shade in order to grow, so they are normally grown among other fruit bearing trees such as banana, mango, or papaya trees. This is both good for the soil and the diversity of the farmlands and good for the farmers who can profit off the other fruits as well as the cacao. It takes between two and five years for the trees to begin producing cacao and they have a peak growing period of around 10 years but continue to produce cacao for around 50 years or, on some occasions, decades longer (Young, 3). Some naturally growing cacao trees deep in the rain forests have been report by locals to be over 500 years old. Cacao is grown in a pod with similar shape and size to a football. It takes between five and six months for pods to ripen after it flowers. The pods vary in color and can be green, brown, red, orange, or yellow. Within each pod are typically between 30 and 50 beans surrounded by a white pulp (Young, 44).

Figure #4



(IELTS, 1)

The cacao supply chain begins with the cacao pods and travels through different processes and hands before reaching its final chocolate form in the hands of a consumer. Figure #4 shows a visual of the cacao supply chain. The supply chain begins with harvesting. When harvested, the pods are cut off either with a machete or, for higher pods, a long pole with a cutting edge. Special care is taken not to damage stalks so they can continue to produce the next year. A local Belizean farmer, Feliciano Pop, described the harvesting process in Belize. He said that pods are harvested every week for eight months out of the year. For the other four months, the farms are maintained by pruning the cacao trees and eliminating excess shade. After cutting the cacao pods from the trees, the farmers crack open the pods and harvest the beans which are covered in a white fruit called baba; at this point the beans are called wet cacao. Once removed from the pod, the wet cacao is removed and

placed onto large leaves; frequently banana leaves are used. The beans are then fermented in order to remove the pulp, stop the bean from germinating, and to give the bean its flavor. Some farmers do this process themselves by placing the beans between banana leaves or in specialized boxes while others sell their beans when it is still wet cacao and let the intermediary groups (discussed in the next paragraph) take care of the process from this point onward.

The fermenting process takes about 5 days and then the beans are placed in the sun to be dried which takes an additional 2 to 3 weeks (Maya Granit interview). A cacao tree on average produces around 30 pods with about 40 beans in each pod. This means a tree can produce two to three pounds of dried beans every year (National, 4). According to Estevan Assi, a representative from the Toledo Cacao Growers Association, productivity of Belize's cacao is about 200 lbs./acre/month.

At this point the dried beans are ready for export and the bean leaves the farmer's hand and is transferred to an intermediary, which buys cacao from hundreds of farmers in order to have the bulk necessary for export. These intermediaries are often known as cooperative groups or growers associations because of their relationships with the farmers and the relationships they help the farmers build with each other. These cooperative groups are a critical step in the cacao supply chain because no farmer produces enough cacao by themselves to have enough to export to international chocolatiers. In Belize, this step is especially important because the nearest port is in Belize City, which is around a 3 to 4 hour drive from the Toledo district.

The two main groups that act as this intermediary in Toledo are Maya Mountain Cacao (MMC) and the Toledo Cacao Growers Association (TCGA). Both these groups serve

not only as intermediaries between farmers and the international market, but also serve as a resource for farmers to better their product. Both groups offer organic and Fairtrade certifications which allow farmers to receive a higher price for their product. Both groups also offer training and demonstrations to teach farmers entering the cacao industry the best techniques to yield high harvests. The services these groups provide farmers and the typical business transactions that take place are discussed in separate sections of this paper devoted to TCGA and MMC.

Once the cacao is exported, chocolatiers convert the cacao beans into chocolate. This consists of four basic steps; winnowing, roasting, grinding, and pressing. Winnowing is the process of removing the thin flakey shell from the bean. This is done by cracking the shells using compressed air to separate the shell from the bean. The beans are then taken to an oven for the roasting process. The beans are roasted at between 105 and 120 degrees Celsius, for a time that varies depending on if the beans are going to be used for cocoa or chocolate. The roasting process is what gives the bean its final flavor and aroma that is typically associated with chocolate. The next step is grinding the beans into a chocolate liquid called cocoa mass. This is done using stones and friction to grind the beans into this thick liquid. The mass contains 53% to 58% cocoa butter, the essential ingredient in chocolate. The mass is then pressed to remove the cocoa butter and the solid pieces remaining are used for cocoa powders for drinks or cooking. The cocoa butter is then mixed with other ingredients and solidified into its final chocolate bar form.

Toledo Cacao Growers Association

The Toledo Cacao Growers Association (TCGA) is a non-government organization that has been working with small farmers to help them increase production of organically

grown cacao and provides exportation of this cacao from local to international markets.

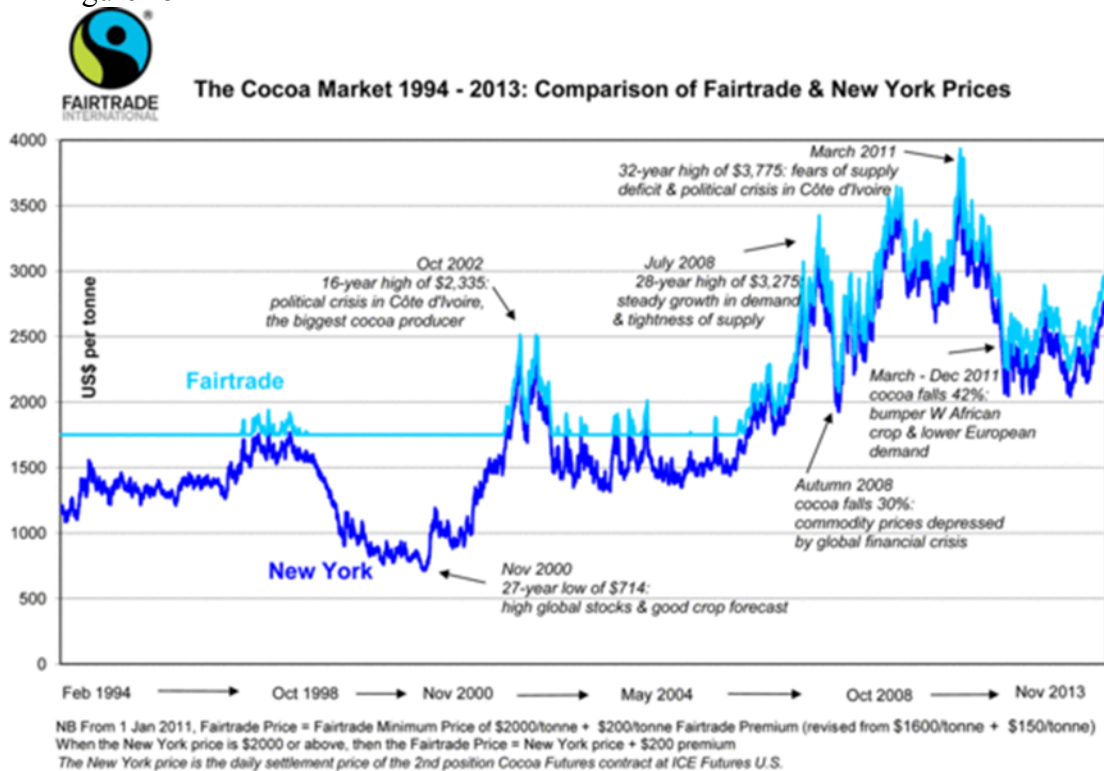
TCGA has been operating since 1986 and was originally working with around 200 farmers in the Toledo District. By the end of 2007, TCGA was working with 1,020 farmers and had expanded its reach to farmers in the Stann Creek and Cayo Districts. Currently, most likely due to competition from other cacao organizations such as Maya Mountain, TCGA works with around 700 active member farmers in 55 communities in the Toledo, Stann Creek, and Cayo Districts. The average number of acres cultivated by each farmer is about 2 acres (TCGA, 1).

TCGA provides a variety of services to farmer members. Some services that TCGA provides to local farmers are technical training and education, farm consultations, organic inspections, and quality control. All these services benefit both the farmer and TCGA. The farmer education and training allows farmers to use better farming techniques in order to produce higher yield. According to Estevan Assi, a representative from TCGA, productivity of Belize's cacao is 200 lbs./acre/month which is an improvement from 2007 where the average was only 125 lbs./acre/month. This shows the effectiveness that the training has had thus far.

Another service that TCGA provides farmers is their certifications. TCGA is Fair Trade certified and organic certified by both the Soil Association, a UK based organization, and the Canadian Organic Regime. These certifications ensure that TCGA works in harmony with the natural ecosystems as well as supporting the socio-economic development of the region. This plays a large role in attracting Mayan farmers to enter the cacao industry because of the Mayan's deep belief of working with the land and their deep respect for the environment. These certifications also allow for farmers to get paid higher prices for their product. Since

Fairtrade International established new minimum prices, which became effective in January 2011, the Fair Trade minimum price has increased from \$1,600 to \$2,000/metric ton and from \$1,800 to \$2,300 for conventional and organic cocoa beans respectively (Rice, 11). With the price of cacao fluctuating daily on the market and having huge swings (with historic lows of \$714/metric ton in 2000 to a high of \$3,775/metric ton in spring of 2011), farmers are protected with this minimum price (Rice, 11). If the market price is higher than the minimum buyers pay the market price, but when prices fall below the minimum farmers are protected. Since Fairtrade International established new minimum prices, which became effective in January 2011, the Fair Trade minimum price has increased from \$1,600 to \$2,000 per metric ton and from \$1,800 to \$2,300 for conventional and organic cocoa beans respectively. This can be seen more clearly with Figure #5 below.

Figure #5



(Cacao [Chart], 1)

Currently TCGA sells the beans on the international market for between \$4,000 and \$4,500/ metric ton and sells 75% to Germany and the US and 25% to local chocolatiers, according to Assi. With these certifications and high quality, both the farmers and TCGA can expect greater prices from their beans.

Maya Mountain Cacao

Maya Mountain Cacao (MMC) acts as a cacao processing and exporting operation in order to give local farmers greater market access and control quality of the product. Local farmers by themselves would experience incredible transportation and shipping costs if they had to export their product themselves. They would also have difficulty gaining access to 110 chocolate makers who are interested in buying Belizean cacao (Uncommon, 16). Through MMC, farmers can sell their product directly to them and MMC can transport and export the finished product in bulk. In 2014, 309 cacao farmers and their families in Southern Belize partnered with Maya Mountain Cacao in order to sell their product (Uncommon, 11). Every week, MMC trucks travel around 31 rural villages to pick up the freshly harvested wet cacao and pays farmers directly for the transaction (Uncommon, 11). They purchase wet cacao instead of dried so they can control the quality of the dried beans by controlling the fermenting and drying process. Control of these important processes also allows MMC to sell a more uniform product. Seventy-five percent of the farmers that work with MMC rely on farming as their sole source of income and cacao is their main cash crop. Because of this fact, MMC wants to make sure the farmers are getting fair prices for their product, \$0.60 out of every dollar that Maya Mountain makes goes to the farmer. In 2014, Maya Mountain bought their wet cacao for \$0.55 per pound, a seven cent increase from the previous year. This

increase in price along with increase in annual farmer yield has caused the average farmer annual income to increase from \$201 in 2013 to \$389 in 2014 (Uncommon, 12).

MMC has also partnered with Kiva and gave 187 farmers access to \$133,625 worth of affordable micro loans in order to expand their farms, purchase high yielding seedlings, prune their farms to increase yields and prevent disease, and hire workers to help maintain and clean their farms (Uncommon, 13). Kiva is a non-profit organization that connects people from all over the world to those who do not have access to traditional banking systems through the use of the World Wide Web. Their funds are provided primarily through lender donations but also raised through grants, corporate sponsors, and foundations. (Kiva, 1) For the farmers, these loans would be impossible to acquire without their partnership with MMC. Often times farmers do not have the collateral to get the loans from a conventional source or cannot afford the high interest rates that banks offer. The loans through Kiva are non-collateral based and charge low to 0% interest rates. MMC also helps farmers expand their farms by growing seedlings and selling them to the farmers at \$1 apiece. In 2014, MMC sold 58,998 seedlings to farmers, fifty of whom were first time cacao farmers (Uncommon, 15). These seedlings allow farmers to grow their farms with inexpensive investments. They also give new entrants into the cacao farming industry an easier way to enter the market.

Another important aspect of the farmer's partnership with MMC is that Maya Mountain helps the farmers get USDA organic certified. Between 2013 and 2014, MMC helped 34 farmers become organic certified and increased organic certified acres from 542 to 1,175 (Uncommon, 14). The main two contributions of the organic certification is 1) the Mayan people producing cacao in a sustainable manner, which agrees with their beliefs in man and nature living in harmony, and 2) farmers receiving higher prices for their product.

THE ACCOUNTING SYSTEM

Surprisingly, despite the overall poverty in the area, some farm owners that produce cacao for export, instead of personal use, have the resources to afford a computer. Also the cooperative groups have access to computers and Internet. Because of the technological resources available, the best means to provide farmers an accounting system would be through an Excel spreadsheet. Even if farmers do not have computers, the system can be printed and manually filled out by farmers and the manually filled sheet can then be given to the cooperative groups to input the farmers' data. The outputs and information the system provides can then be printed and given to the farmer to use for future financial planning.

Because almost all of the farms are small and family owned, the spreadsheet will take into account all the income and expenses of the family in order for farmers to determine if their farms are producing enough for them to make a fair living. The farmers in Belize need an accounting system that is relatively easy to work with and helps them to better understand their financial situation. While a plethora of information is nice to have, it is useless unless it can be easily used by farmers to make timely and effective decisions on their farms. This is why simplicity of use and understandability of information is more important than designing an incredibly intricate and complex system which can produce hundreds of numbers which may mean something to accountants, but nothing to farmers.

Because of the importance of understandability and ease of use, the finished spreadsheet will be color coded. Highlighted yellow fields show areas where required data must be entered or the answer to a question must be selected in a drop box. Red font color with bold borders around the cell will indicate important totals. Highlighted blue cells are areas which the farmer has the option of filling in, but is not required to do so. Some of these

areas are for specific situations, such as if the farmer sells bananas along with his cacao and therefore needs to enter revenues from the sale of the bananas. Other times the blue cells are for further information like adjusting numbers to see how they affect the budget; an example of this can be seen with the average units of cacao produced. Important totals, such as total expenses or total revenue are in red font and surrounded by a thick border.

Production and Revenues Budget

The spreadsheet creates a very detailed cash budget for these farmers and their families. Because farming is an industry in which profit margins are very low, it is important for farmers to have a cash budget in order to understand how their money is being used. This cash budget begins with a few questions to get started. The first question is the time frame of the budget, either yearly or monthly. The answer is selected using a drop box macro and after an answer is selected, changes in the budget calculations are made automatically. The next question is what units are being used to measure production, either pounds or kilograms. Once again the drop box macro is used and calculations are changed automatically based on the answer. A final question asks whether the cacao will be sold wet or dried. As mentioned earlier, Maya Mountain Cacao purchases their cacao wet from farmers to better control quality. According to Minni Forman, a representative from MMC, dried cacao is approximately 0.37 times the weight of wet cacao. This effects the calculations for average amount the tree produces every year. It also affects the price of the cacao, since buyers pay less for wet cacao because of the extra processing necessary. Once these questions are answered and new information is inserted in highlighted cell, the system will not change any numbers that have been inserted based on a change in the answer choice of a question. For example, if a farmer chose a yearly budget and inserted the annual revenue he made on the

sale of bananas into the “Crop B” row, then he changed the answer to the first question to monthly, the banana revenue would not automatically be divided by 12. That would need to be done manually by the farmer then reentered into the appropriate cells. This is true for all cells throughout the spreadsheet. When changing the answer to a question some cells may not need to be changed, such as total number of acres, but most cells would most likely need to be changed.

After the questions are answered, the first set of calculations is the total production budget. The goal of the production budget is to show the farmer about how many pounds of cacao he will produce that period, either that year or that month depending on the answer chosen in the first question. The calculation is the number of trees per acre multiplied by the total number of acres to find the total number of trees on the farm. After talking to Estevan Assi, from TCGA, and Maya Granit, from MMC, there are different opinions and advice on how many trees to plant on an acre. Granit said that Maya Mountain advises farmers to plant between 400 and 450 trees on an acre while Assi reported that TCGA farmers average only 300 trees per acre. Because there is no set number of trees per acre or number of acres a farmer owns, these numbers will need to be entered into the system and the calculation will be done automatically. If the farmer knows exactly how many trees are on his farm, but doesn't know the number of trees per acre, he can skip this initial calculation and enter the total number of trees in the proper cell. The next calculation is the total number of trees multiplied by the average amount of cacao produced per tree to find the total units, either pounds or kilograms, of cacao produced in a given period. This calculation is simple, but is complicated by the average production amount per tree. The average production can range a bit depending on a variety of conditions; such as soil, slope of terrain, shade, rainfall, variety

of cacao tree, and farming techniques; but most trees produce around two or three pounds of dried cacao per year (Young, 48). When making accounting estimates, it is important to use the conservatism principle of accounting. This principle states that assets and revenues should be recorded only when they are assured of being received and liabilities and expenses should be recorded as soon as possible when there is uncertainty about the outcome. The principle can be summarized by this: when choosing between multiple methods of recording a transaction, one should choose the method that would make profit lowest or the value of an asset lower. Especially when creating a budget, this method is important so the difference between actual results and an estimate is not a painful surprise. In other words, if the budget predicts making \$100 and the actual results are \$150 the budget was wrong, but wrong in a way which you have more money than expected. This is bad because money could have been better invested into the company, but does not affect the company's overall financial credit which is good. While if the budget predicted revenues of \$100 and actual results were only \$50 now the budget is wrong in a manner that you have less money than expected. This is bad because bills that were expected to be paid with the extra \$50 will go unpaid and can cause the company serious credit issues and possibly endanger the company to bankruptcy if the budget prediction had a large variance from actual results. Even if the company is in good financial standing in the current period, money that was expected to be used to invest in the company for the next period, such as inventory for a merchandise store or seeds for a farm, is not available and can then damage the company in the next period. Therefore, when predicting between two or three pounds of cacao per tree per year, the system takes the conservative approach and uses two instead of three. The system takes into account the answers to the questions. Such as when wet cacao is chosen, annual production is changed to

5.41 pounds instead of 2 to reflect the different weight of wet cacao versus dried. The 2 pounds is also automatically converted into 0.9072 kilograms depending on the answer to question 2. Also both pounds and kilograms and wet and dried are divided by 12 to find the monthly production. So the total number of trees is multiplied by total production per period to find the total production.

If a farmer knows that his trees produce more or less per year he can change that number in the side box titled “Average production per tree.” The blue cells indicate the numbers the farmer can change and automatically converts to the other form of measurement in the below (for kilos) or above (for pounds) cell. Important note: a farmer should only change the highlighted blue cell, but should make sure that both columns are equal. So, for example, if a farmer knows his trees produce three pounds instead of two, he would go to the highlighted blue pounds cell and change the total number of pounds produced to 3. Then he should also set the highlighted blue kilograms cell equal to the white kilograms cell to make sure the budget formula inserts the right number into the calculation. So, continuing the above situation, he would enter in 1.3608 into the highlighted blue kilograms cell. Once the total number of trees is multiplied by the units produced per tree, the result is the total units of cacao the farm has produced in that period. Another important note is that the wet cacao production is not linked to the dried cacao production. Therefore, if a farmer changes his dried cacao production and is using “wet cacao” as his answer to question 3, then this change will not affect his numbers. To find wet cacao output from dried cacao number the formula is: dried cacao weight divided by 0.37 equals wet cacao weight. Conversely the wet cacao to dried formula is: wet cacao weight times 0.37 equals dried cacao weight.

From the total production number, the revenues budget can be produced. The revenues budget takes the total units of cacao produced and multiplies it by the selling price per unit of cacao to find the total revenues from cacao. There are additional highlighted blue cells where other crops can be added, since many farmers grow other crops along with cacao because cacao trees require canopy shade. In these cells, the total amount of a crop produced can be entered in the units produced column and the price they receive per unit in the price per unit column. These numbers can be found by the farmer by using estimates or units from the previous year. As mentioned earlier the highlighted blue cells are not required to enter information, but should be taken advantage of if money is being made from other secondary crops. The totals of all the rows, revenues for each crop, are added together to find the total revenue from crops.

There is an additional revenue section in which can be added revenues from sources other than crops. For example, Eladio's Chocolate Adventure not only had Agouti Farm and the crops it produced to produce revenue, but also the charges for tours of the farm and the river adventures and the traditional Mayan crafts and chocolate that were sold separately. In many traditional Mayan families, the women will produce crafts or dresses and sell to tourists. Also because of rising tourism in the region, some farms are participating in agriotourism and giving tourist tours of their farms for a price. Some are also producing and selling their own chocolate. Because of these factors the additional table is necessary, as an option, to keep track of additional revenues.

Once the total for other revenues is found, the system then takes that total along with the total crop revenues and adds them together to find the total budgeted revenues. It is important for the farmer to remember that this is just a budget, and a budget is not a fortune

teller. While the system is designed to project future revenues, the system cannot predict the future selling price of cacao, the actual amount of cacao each tree will produce, or the amount of other crops sold or additional revenues. These are all simply estimates based on historical data. Estimates should become better as the system is used since the actual numbers produced at the end of one period can then be used to make estimates for the next period.

Labor and Expenses Budget

The second sheet in the system is the labor and expenses budget. This budget takes into account all the expenses of the farm and household. Because the major expense for cacao farms is labor, this expense has its own table to calculate it. Laborers are needed all throughout the year on the farms to harvest the cacao and also to prune the cacao trees and eliminate excess shade. Feliciano Pop described to me the process of hiring workers. Individual laborers are hired by the farm owners and can be paid daily wages or a contracted salary to complete a job. The laborers and the farmer negotiate the wages or salaries before they are hired. Because workers can either be paid by salary or wage, the system takes into account both situations. At the beginning of the labor budget is a cell requesting the farmer to enter his total number of workers. The next few cells requests the total number of wage workers, the daily wage, and the number of days workers are expected to work. These three numbers are multiplied together to find the total cost of wage workers. The next section asks for the total number of contract workers and the average salary per contract worker. These numbers are multiplied together to find the total cost of contract worker. Total cost of wage workers and total cost of contract workers are added together to find the total budgeted labor costs, which is then automatically taken to the first row in the expenses budget.

The expenses budget contains all the expenses of both the farmer's farm and household and breaks down expenses into these two categories. The farm expenses include basic expenses such as labor, farm equipment, gas for the truck, and truck payments. It also includes the purchase of assets as expenses, because this is a cash budget and these purchases deplete cash. Such transactions include the purchase of seedling and land. More space is provided to add additional expenses as every farmer's situation is unique. Home expenses that have been automatically included are house payments, food, school expenses for children, and basic utility bills. As with farm expenses, there is additional room for other expenses that can be added. All estimated expenses are added together to find total budgeted expenses. There are also subtotals for total estimated farm expenses and total estimated home expenses. As with the revenues budget, it is important to remember this sheet is just the budget, not the actual results. The figure in reality may be higher or lower than the estimates here and will be reflected in the "Actual vs Budget" sheet.

Actual Revenues

The third sheet is the Actual revenues sheet. This sheet helps the farmer keep track of his daily (if creating a monthly spreadsheet) or monthly (if yearly) revenue from sales. It also allows the farmer to keep track of the amounts of cacao he sold each period. All the sources of revenue from the revenue budget are included in the actual revenues section. In a monthly budget, a farmer can keep track of his sales on a daily basis. Every day after selling his product, he takes the receipts home and enters the information into the spreadsheet. For example, if a farmer sold 10 pounds of dried cacao for \$3.50 per pound on the 5th day of the month, he would take his receipt and access the system. He would make sure the system was set to monthly in question 1 and go to the "actual revenues" sheet. Then he would proceed to

go to the 5th column and insert \$35 into the cacao row under “Crop revenues” and also enter 10 into the “amount of cacao sold” row. As the farmer fills out the actual revenues a total is taken at the end of the spreadsheet. Subtotals are also taken. There is a subtotal for total crop revenues and total other revenues, along with subtotals for each day, if monthly is selected, or month, if yearly is selected. In the monthly budget, a mid-month total is also added to help the farmer keep track of his costs as he approaches the end of two weeks. This sheet allows the farmer to easily keep track of his revenues and also to see totals for each revenue item and category. It also allows him watch his numbers grow as he approaches the end of the period so he can monitor his budget.

Actual Expenses

The actual expenses worksheet accomplishes the same goals as the actual revenues sheet in the exact same manner. Expenses are categorized into farm expenses and home expenses, just as they are in the expenses budget, and the system allows a farmer to keep track of his daily or monthly expenses, based on the answer choice in question 1. Just as in the revenue budget, subtotals are taken for total farm expenses and total home expenses. Subtotals for daily or monthly expenses are also taken and mid-month totals are taken for the monthly budget option. The actual expenses worksheet allows the farmer easily stay up to date on entering his expenses see the period totals to see where and when he spends the most money. It allows him to see totals for individual expense items and monitor his spending on each item. The expense worksheet also contains a row for total profit or loss. This is calculated taking total revenues and subtracting total expenses. This is done for every day or month, depending on the budget type, to allow the farmer to see his profits for each sub-period. This tool is especially helpful in the yearly budget because the farmer can see in what

months he did well and what months he did poorly and adjust his strategy to duplicate results from the profitable months. Along with total profits row there is a total cash on hand row. This row is calculated by starting with beginning cash on hand, which needs to be entered by the farmer, and adds the profit or loss from the first column and any loans received in the first column, which should also be entered by the farmer. The cell in the second column calculates the cash on hand from the previous cell and adds the profit or loss and loans received from the second column, this continues until the period is completed. A farmer who knows his total cash on hand knows what he can or cannot afford to buy on any given day or month and this allows him to better plan for future purchases.

Labor Expenses

The labor expenses sheet is designed to allow the farmer to keep track of the money he is paying his laborers. As mentioned above, in the labor budget section, laborers can chose to be paid by daily wages or by a contracted price per job. The labor expenses budget takes into considerations both forms and has tables for both types of workers. The first table deals with wage workers. The farmer can enter the name of the worker in the first column and the daily wages they have agreed to in the second column. In the third column the number of days worked by this worker is entered. The farmer then enters the amounts he has paid each individual worked in the fourth column. A similar process is done in the second table for contract workers. The farmer enters the agreed on price for the worker to complete a job and also enters the amount he has paid. The total labor expense is calculated by the adding the total amount paid to wage workers to the total amount paid to contract workers. Because this is cash based budget, no expense is taken for money owed, but this number is carried over to the important stats sheet for the farmer's consideration. With this worksheet, the farmer can

easily keep track of agreed on rates and salaries for paying workers, how much the worker has earned, how much he has been paid, and how much is still owed. This will greatly reduce misunderstandings between workers and farm owners. This spreadsheet does not connect to the actual expense worksheet, therefore when the farmer pays workers he will need to enter this information twice, once into the labor expenses sheet for the amounts paid to individual employees and again into the actual expense sheet under daily labor expenses for the total paid to workers that day. At any given point in time, the total in labor expenses in the actual expense sheet should be equal to the total labor expense in the labor expenses sheet, if they are not equal there had been a mistake in keying in the data.

Actual vs Budgeted

One of the most important worksheets in the system is the actual vs budgeted sheet. This sheet takes all of the budgeted estimates in the productions and revenues budget sheet and the labor and expenses budget sheets and compares them to the actual revenues and expenses in the actual revenues, actual expenses, and labor expenses sheets. An actual and budgeted comparison is done for every separate revenue and expense item. The difference between actual and budget is also found. Differences indicating a variance that resulted in higher cash than expected is shown by a positive number and variances that results in lower than expected cash is shown as a negative.

Revenues and expenses are not the only items with actual and budgeted comparisons, there are also non-monetary and per unit variances calculated for more information and better understanding. The first table in the worksheet calculates the actual vs budgeted amount of cacao sold, the average price received per unit, and the average production per tree. The actual results from this table can be used in the next period's estimations in the production

budget. Other non-monetary or per unit variances that are calculated are total number of workers, total number of wage workers, total number of salary workers, average daily wage, number of days worked, and average salaries. The actual results from these numbers can be used for better estimates in the next period for the labor budget.

The actual results from the all the revenues and expenses line items can be used to make better estimates for the budget next period. The only information that needs to be entered into this sheet is the total number of workers, the number of wage workers, the total days worked, and the number of salary workers. These are the only items that have not been already calculated elsewhere in the system or can be calculated using numbers already entered. All the other values are entered automatically as the spreadsheet is filled out. This makes this work sheet particularly useful in seeing comparing budgeted amounts to amounts already spent/received during the period. At any point the farmer can compare his current actual results to the budget and see how close or far he will be from the initial estimates and change purchasing or selling behavior based off these results. The farmer's ability to make better business decisions based on the numbers in this system is the ultimate goal of the system and the actual vs budgeted worksheet is the best sheet for the farmer to accomplish this goal.

Important Stats

The final sheet in the system is the important stat sheet and has many useful statistics for the farmer to analyze. Along with the actual vs budgeted work sheet, this is the best sheet for making positive business decisions. This worksheet begins by showing the total income or loss of the farmer that period, which is calculated by subtracting total expenses from total revenues. The next table shows the profit or loss of the farm specifically by subtracting farm

expenses from total crop revenues. Per unit profits are shown in the third table. In this table, the average price received for cacao per unit, pounds or kilograms, is taken from the actual vs budgeted worksheet. Then the direct cost per unit is calculated by dividing the total farm expenses by the total amount of cacao sold. This number is the price of cacao that needs to be received in order for the farm to break even from cacao sales. The direct profit or loss is simply the average price received per unit is subtracted by the direct cost per unit. To find the total profit or loss per unit, the total cost per unit needs to be calculated. Total cost per unit is found by dividing the total expenses by the amount of cacao sold. The average price received per unit needs to be higher than the total cost per unit in order for the farmer to pay all the expenses of both the farm and the home with the revenue from the sale of cacao.

Another important stat on this sheet is the cash on hand and money owed numbers. Cash on hand is taken from the final cash on hand from the actual expenses sheet and money owed is taken from the sum of the totals owed to wage workers and contract workers. The cash on hand and money owed gives the farmer a better idea about his financial standing. Cash on hand provides a farmer the knowledge of how much cash he currently has and provides him with the knowledge to plan how he will spend that money until he receives another payment for his product. The “money owed” stat allows the farmer to see his commitment to pay workers and should be one of the first uses of his cash on hand. The “cash after workers are paid” total is found by subtracting the total owed to workers from the total cash on hand. This shows the farmer a more accurate total of how much money he has after his most current liability has been paid off.

The final set of tables in the system is calculations of actual totals from every revenue and expense line item and that line items percentage of total revenues or expenses. This

allows the farmer to quickly see what percentage of his income comes from what sources and what percentage of his expenditures goes to separate items. Seeing these percentages will allow the farmer to focus on revenue streams that are most important to the success of his business, for revenues with high percentages, and also allow him to nurture and put more effort into potentially higher yielding revenue streams, from lower percentage revenue items. Expense percentage can be extremely helpful as well. High percentage expenses show the farmer his main source of spending and can allow him to adjust his strategy to cut costs in that area. Seeing other expenses and their percentages being higher than imagined will also allow the farmer to see expense items that can be better controlled in future periods.

This worksheet is entirely results based. No inputs need to be made into this sheet. All calculations are taken from the actual results that are input in previous sheet. This page is purely for understanding important numbers within the farm.

Farm Accounting System Example

In this portion of the paper, I am going to write a narrative of a theoretical cacao farm and use that data to enter all the information into the accounting system to show the effectiveness of the system. The numbers I will use for all transactions except cacao (such as selling price from bananas or cost of gas) are completely theoretical and not based on any research or actual prices for these transactions.

The narrative: On Toledo Cacao Farm, Michael is the owner and is creating his monthly budget. He measures his cacao production in pounds and sells his cacao wet. He owns a larger than average farm, 5 acres, and has 400 trees per acre. Michael believes each of his trees produce about 6 pounds of wet cacao per year and gets paid \$1.10 per pound. On his farm, he also grows bananas and mangos. He believes he'll harvest about 500 lbs and 250 lbs

of bananas and mangos respectively. Bananas are sold for \$0.50/lbs and mangos sell for \$0.85/lbs. Michael also gives tours of the farm on Wednesdays and Thursdays and Michael's son leads these tours. Michael's wife and daughters make crafts and sell to the tourists as they come to the farm. Michael predicts that they'll make \$100 from tours and sell 20 crafts at an average of \$10 each. All this information is entered into Michael's Production and Revenues Budget.

Michael has 8 employees; six work on a \$4 daily wage and two will get paid \$100 each after they finish the job at the end of the month. They all work Monday through Friday and the wage workers get paid every Friday. This month the 1st is on a Tuesday and the 31st is on a Thursday, so there are 23 work days. All this information is entered into the labor budget. Michael also knows that he needs to buy a wheelbarrow and some new machetes for the farm and he estimates they will cost \$50. He also estimates they will need \$100 in gas that month. Routine expenses that he knows need to be paid during the month are the house payment (\$250), the car payment (\$100), electricity bill (\$100), phone bill (\$15), Internet bill (\$25), and his children's school fees (\$25). He also predicts that his family will spend \$25 at the local store on groceries (Most of his food is grown from the family garden). After all these numbers are entered into the Labor and Expenses Budget, Michael is ready to start his month.

During the month, the cooperative group comes by his farm on Fridays and buys what cacao he has harvested. This month he produced 200 lbs the first week, 265 lbs the second week, 275 lbs the third, and 253 lbs the last week. He gets paid \$1.10 per pound the first three weeks, but prices were raised the last week so he receives \$1.12 per pound for his last batch. He receives \$220, \$291.50, \$302.50, and \$283.36 for each week. Michael sells the

bananas and mangos he harvests on Saturdays at the market. The four weekends he made the following amounts for bananas and mangos respectively: \$55 and \$60, \$65 and \$55, \$50 and \$70, and \$67 and \$64. Nine tours are given throughout the month to different sized groups. They received \$10, \$15, \$25, \$35, \$15, \$25, \$10, and \$15 from each of these tours. During the tours they also sold crafts and received \$10, \$15, \$25, \$15, \$10, \$5, \$20, \$15, and \$5. These are entered into Actual Revenues.

In Michael's Labor Expenses, he puts in the names of his six wage workers; Melvin, Nelvin, Delvin, Alex, Gustavo, and Estevan; and his two contract workers, John and Gabriel. Michael keeps track of the number of days each has worked along with any money that he owes them from the last month and how much he has paid them. All of his workers worked 23 days out of the month except for Nelvin, who worked 19, and Gustavo, who only worked 14. Every Friday he enters the amounts he paid his workers. \$120 the first three weeks, \$100 the fourth week (since Gustavo wasn't working). Michael also pays John and Gabriel their \$100 each for their help in completing the job that month. Notice how even though four workers worked four days the last week of the month, because they have not been paid yet an expense is not recorded. This is a key element in a cash based system.

For the Actual Expenses, Michael paid the electricity bill for his home (\$100) on the first of the month and the next day bought \$50 in gas to fill up his truck and bought the equipment he needed for the farm (\$57.35). The first Friday of the month (4th), he paid his Internet (\$25) and phone bills (\$15). Through the month, expenses were relatively few; just filling up the truck with \$50 of gas on the 14th and 27th. At the end of the month, Michael paid his house payment (\$250) and his children's school fees (\$25). Michael's wife, Catalina, goes to the store and picks up a few items throughout the month at differing intervals. She

spends \$2, \$5, \$1, \$5, \$6, \$2, \$4, and \$3 on the 2nd, 4th, 9th, 12th, 15th, 22nd, 25th, and 29th respectively.

The finished result of the month of transactions can be seen on the Actual vs Budget worksheet and the Important Stats sheet. Michael made slightly less than expected from the sale off cacao mainly because he produced slightly less than expected since he actually received a higher average price than he thought. He made more money from mangos and less from bananas than expected and also made less money from crafts than expected, but had higher revenues from tours. His labor actually cost him less than expected and the rest of his expenses were the same except for a few standouts (\$50 over budget in gas, \$7.35 over in equipment, and \$3 over on food). This leaves us with a total profit of \$478.01 for the month, which was \$57.51 better than expected. High level, other important stats include: \$608.34 of cash on hand (\$544.34 after workers are paid), a farm profit of \$616.01, 58% of revenue coming from cacao sells, and 47% of expenses going to labor.

PROJECT IMPLEMENTATION

The way in which this accounting system is implemented is a crucial step in the systems success. The system is useless unless it can be given to a farmer, the farmer uses it, and farmers can understand the information given to them and use it to make better business decisions. This will require a workshop for farmers to attend who want to use the system that gives a tutorial in excel and teaches farmers how to input numbers into the system and show what these numbers mean and how to use them in the future. This can best be done through the cooperative organizations, such as TCGA or MMC, that already have close relationships to the farmers and give the farmers lessons in better farming techniques. Now another service they will be able to provide will be to develop better financial literacy among the farmers,

giving them the ability to understand the financial standing of their farms. Farmers can always use this resource for questions and advice on how they can better manage their farms.

In order for these cooperative groups to be able to teach and understand this system, the system must be taught to them. This can be done by students from Appalachian State University's Walker College of Business. For the past several years, the College of Business has done a study abroad to this region of Belize and has many connections within the cooperative groups. This study abroad is a service based study, in which students from the College of Business go to these cacao farms and help farmers in their marketing and supply chain strategies. Based on former trips, the previous director for this study abroad believes it would be more beneficial to work more closely with cooperative groups than with farmers because he feels students can make a bigger impact at this level than with farmers. Students teaching representatives from cooperative groups how to use this system would be a project for future study abroad trips that would greatly benefit the cacao industry in the area. The system is easy enough for any business student to understand completely and be able to explain the numbers within it to member in the cooperative groups.

Because of the continued contact and relationship the College of Business has with the people of this region, any changes or suggestions for modifying the system, by making it easier for farmers to use or the system providing additional information that is not currently available, can be used to make these changes to provide updated versions of the system. Because of my interest in the area, I would be happy to make these changes myself and give the updated version to the College of Business so they can teach the cooperative groups about the update on their next trip. Another possibility would be that students going on the study abroad could make these changes. The students that go on this trip have a variety of

majors and expertise, therefore if any of them are Computer Information Systems (CIS) majors, they should have the skills required to make these changes. However the College of Business' Belize program decides will be best for the farmers and cooperatives using and teaching the system will be fine.

At this point in time, the director of the Belize study abroad is leaving the College of Business and Appalachian State. The International Business program is hoping another faculty member will step up to take control of the Belize study abroad, but at this point the position is left empty and the trip is not being planned for next year. Upon discussion with other professors within the College of Business, a few are interested in directing the program. If, for some reason, the College of Business does not do a study abroad trip again, there are other methods to get the system there. I could go to Belize myself with research funding and in order to give workshops on how to use this system. I am also in contact with representatives from the cooperative groups, Estevan Assi from TCGA in particular, and can communicate and teach the system through Skype or other online communication tools. Another option is getting in contact with PwC and seeing if I could potentially work with their firm's "Project Belize" to get to Belize and teach the system. While I believe the College of Business study abroad would be the best way to get the system there and continue to monitor its success and correct future issues, there are other ways to deliver and implement this system.

CONCLUSION

Poverty is rampant in the Toledo district in southern Belize. Large percentages of the population there cannot afford basic needs, such as access to healthcare, transportation, and education. A large percentage of those impoverished cannot even afford their basic food

needs in order to live a healthy lifestyle. The population that is hit hardest by this poverty is the Mayan ethnicity. The culture that originally thrived in this region is now suffering the most. The poverty of this district is a major problem and needs to be addressed.

The cacao industry in this region has been and is growing and could easily be the most crucial factor in bringing the people of this region out of poverty. This could be especially helpful to the Mayan culture, as cacao is an important part of their history and lifestyle today. But a problem still remains: the lack of information about the financial benefits and sacrifices of this industry has caused the industry problems in gaining new entrants. Growers associations have the capabilities and the desire to add more farmers to their groups, but do not have the information needed to attract these new farmers into the cacao industry. Farmers also have difficulty in making investing decisions about their own farms. It is hard for them to make financial sacrifices that may benefit them in the future, because they are unsure if they can afford these sacrifices. Cacao farmers in Belize have no idea of how much money they spend in maintaining and harvesting their farms and only have a minimal knowledge of the money they receive from the sale of their products. At this point in time, farmers are operating in financial darkness, unsure of their future costs and revenues and merely trying to survive from pay check to pay check. While these farmers are benefiting from the cacao industry, right now it is impossible to quantify how much they are benefitting. And while farmers know they are making money by growing and selling cacao, they have no idea how much money they make or how they can make even more if invested properly.

These problems call for a solution and the solution is relatively simple. Cacao farmers need this accounting system in place to keep track of all their business transactions and someone to teach them how to use it. This system addresses all the needs of farmers in order

to track their budgets, their cash on hand, their revenues, their expenses, their laborers, and their production. This system can eliminate all the uncertainty associated in operating a business or entering into it for the first time. This system can help farmers run their farms more effectively and efficiently and can also give growers associations the information necessary to attract new entrants into the industry. With more entrants, the industry will grow and can improve the region's economy. With a revived economy, the people of this region can escape poverty and live healthy lives. The hope for this system is that it can be an answer to problems facing the cacao industry and can in turn alleviate the poverty of the Toledo district and help everyone there live a better life.

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